ASTRONOMY MAJOR

Program Director: Melissa Hayes-Gehrke, Ph.D.

The Astronomy Department offers courses leading to a Bachelor of Science in Astronomy as well as a series of courses of general interest to non-majors. Astronomy majors are given a strong undergraduate preparation in Astronomy, Mathematics, and Physics. The degree program is designed to prepare students for positions in government and industry laboratories or for graduate work in Astronomy or related fields. Courses offered by this department may be found under the following acronym: ASTR.

Program Objectives

The Department of Astronomy B.S. program educates majors toward achieving an understanding of modern astronomical concepts, applying physics and mathematics to astrophysical situations, and gaining experience in gathering and reducing data using astronomical instrumentation and computational tools. Completion of this program provides the opportunity for majors to acquire the knowledge and skills necessary for graduate school or employment after graduation.

Program Learning Outcomes

1. Identify basic concepts from the many areas of astronomy, including motions in the sky, gravity, electromagnetic radiation, solar system, stars, and galaxies.
2. Develop mathematical skills, acquire physics knowledge, and practice applying these skills and knowledge in astrophysical situations.
3. Use astronomical telescopes/instruments and reduce astronomical data using modern computational methods.
4. Demonstrate advanced level knowledge in several different areas of astronomy.
5. Describe the current demographic composition of people working in the field of astronomy and how this affects its practice and presents barriers to broader inclusion.

REQUIREMENTS

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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>ASTR288</td>
<td>Special Projects in Astronomy (ASTR288P)</td>
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<td>ASTR288</td>
<td>Special Projects in Astronomy (ASTR288C)</td>
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<td>ASTR288</td>
<td>Special Projects in Astronomy (ASTR288I)</td>
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Required Introductory Physics Courses

- PHYS171  Introductory Physics: Mechanics  3
- PHYS265  Introduction to Scientific Programming  3
- PHYS272  Introductory Physics: Fields  3
- PHYS273  Introductory Physics: Oscillations and Waves  3
- PHYS275  Experimental Physics I: Mechanics and Waves  2
- PHYS276  Experimental Physics II: Electricity and Magnetism  2

Advanced Physics Courses

- PHYS313  Electricity and Magnetism I  4
- PHYS371  Modern Physics  3
- PHYS401  Quantum Physics I  4
- PHYS404  Introduction to Statistical Thermodynamics  3

Supporting Mathematics/Mathematical Methods Courses

- MATH140  Calculus I  4
- MATH141  Calculus II  4
- MATH241  Calculus III  4
- MATH243  Introduction to Linear Algebra and Differential Equations  4

Total Credits  66

1 Also accepted with consent of advisor: PHYS161, PHYS165, PHYS260, PHYS261, PHYS270, PHYS271 (14 credits)
2 For students with experience with computer programming this course can be replaced by PHYS474 Computational Physics or ASTR415 Computational Astrophysics. If students complete ASTR415 for this requirement, it cannot be counted as an advanced astronomy course (400-level course) requirement.
3 Completion of both MATH246 and either MATH240 or MATH461 will be accepted in place of PHYS274.

Grades in all of the above required courses must be "C-" or better.

GRADUATION PLANS

Click here (https://cmns.umd.edu/undergraduate/advising-academic-planning/academic-planning/four-year-plans/four-year-plans-gened/) for roadmaps for graduation plans in the College of Computer, Mathematical, and Natural Sciences.

Additional information on developing a graduation plan can be found on the following pages:

- http://4yearplans.umd.edu
- the Student Academic Success-Degree Completion Policy (https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/#success) section of this catalog